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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|------------------------|---------------------|------------------|
| 10/525,932 | 10/31/2005 | David Michael Doddrell | UNI-116 US | 2837 |

23520 7590 03/19/2007
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| EXAMINER |
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FETZNER, TIFFANY A

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| ART UNIT | PAPER NUMBER |
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2859

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS | 03/19/2007 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | | |
|------------------------------|--------------------|-----------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/525,932 | DODDRELL ET AL. | |
| | Examiner | Art Unit | |
| | Tiffany A. Fetzner | 2859 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/3/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED Second Non-final ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. The drawings filed **February 25th 2005** are still objected to because component **S11** taught on **page 8 in lines 29 and 31** of the original disclosure is not present in **Figures 9A to 9D**.

3. Contrary to applicant's argument on page 8 concerning the drawing objection still maintained above, **all component numbers referenced in the specification must be shown in the appropriate figure, one cannot teach a component, fail to show it, and then incorporate "s-parameters" from an outside source,** as a justification for why component S11 is not shown. The requirement is that every reference number taught with respect to applicant's figures must be shown in the figure which corresponds to the written description. Component S11, therefore since it is taught with respect to **Figures 9A to 9D**, must be shown in **Figures 9A to 9D**.

4. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. The disclosure is objected to because of the following informalities:

A) Component S11 taught on page 8 in lines 29 and 31 of the original disclosure is not present in **Figures 9A to 9D**. Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. **Claims 1-18** are rejected under **35 U.S.C. 102(e)** as being anticipated by **Boskamp et al.**, US patent 6,590,392 B2 issued July 8th 2003, filed April 17th 2001.

8. With respect to **Amended Claim 1**, **Boskamp et al.**, teaches and shows “A radio frequency (RF) coil array for use in resonance imaging and/or analysis of a subject located within a space in which a magnetic field is operatively applied in a first direction” [See figures 1 through 5; the abstract, col. 1 lines 5-53; col. 2 line 13 through col. 3 line 18; col. 4 lines 34-51; col. 5 lines 18-52; col. 6 lines 55-67; col. 8 line 46 through col. 9 line 16.] **Boskamp et al.**, shows in figures 2, 3, 4, and 5 “the coil array comprising a plurality of coil elements angled relative to each other and electrically separate from each other” [See col. 5 lines 18-27; and col. 9 lines 5-16.] (i.e. each coil 72, or 74 has its own electrical connections 80, 82 which feed into the individually separate (i.e. oppositely oriented) end coil pairs 78c, 78d; or 78a, 78b;) [See also figures 2, 3, 4, and 5 in combination.], “each coil element” (i.e. coils 72 and 74) “having a pair of main conductors” (i.e. 78c, 78d; or 78a, 78b;) “extending generally parallel to the direction of the magnetic field and located on opposite sides of the space” [See figures 2, 3, 4 and 5; col. 2 lines 31-37; col. 3 lines 7-18; col. 5 lines 18-27; col. 5 lines 34-52; col. 8 lines 30-33; and col. 9 lines 5-16.] “and a pair of connection conductors” (i.e. the connection

conductors 82, and 84 of figure 3) which are "connected between respective ends of the main conductors". [See figures 2 through 5; col. 2 lines 31-37; col. 3 lines 7-18; col. 5 lines 18-27; col. 5 lines 34-52; and col. 9 lines 5-16.]

9. With respect to **Claim 2, Boskamp et al.**, shows from figures 1 through 5 that "the space is a cylindrical space and the main conductors extend axially and are located diametrically opposite each other." [See figures 1 through 5, and especially figure 3.] The same reasons for rejection, which apply to **claim 1** also apply to **claim 2** and need not be reiterated.

10. With respect to **Amended Claim 3, Boskamp et al.**, shows from figures 2 through 5 that "the coil elements are angularly spaced about the axis of the cylindrical space, ~~and are each located in a respective diametric plane of the cylindrical space.~~" [See figures 2 through 6.] The same reasons for rejection, which apply to **claims 1, 2** also apply to **claim 3** and need not be reiterated.

11. With respect to **Claim 4, Boskamp et al.**, shows from figures 2 through 5, and especially figure 3 that "the coil elements are equi-angularly spaced", **Boskamp et al.**, shows and teaches from the disclosure that "the angle between adjacent coils being $360/N$, where N is the number of coil elements in the array". [See figures 2 through 5, and especially figure 3, in combination with the teachings of col. 2 lines 31-37; col. 3 lines 7-18; col. 5 lines 18-27; col. 5 lines 34-52; and col. 9 lines 5-16.] The same reasons for rejection, which apply to **claims 1, 2, 3** also apply to **claim 4** and need not be reiterated.

12. With respect to **Amended Claim 5, Boskamp et al.**, shows from figures 2 through 5 that "~~at least one~~ the connection conductor" [See components 82, 80] extends around the periphery of the cylindrical space at ~~a respective~~ an axial end thereof to thereby permit access to the cylindrical space through that end." [See figures 2 through 5.] The same reasons for rejection, which apply to **claims 1, 2**, also apply to **claim 5** and need not be reiterated.

13. With respect to **Claim 6, Boskamp et al.**, teaches and shows from figures 2 through 7 that "the coil elements are arranged in one or more orthogonal pairs." [See figures 2, 3, 4 and 5; col. 2 lines 31-37; col. 3 lines 7-18; col. 5 lines 18-27; col. 5 lines

34-52; col. 8 lines 30-33; and col. 9 lines 5-16.] The same reasons for rejection, which apply to **claims 1, 2**, also apply to **claim 6** and need not be reiterated.

14. With respect to **Amended Claim 7, Boskamp et al.**, teaches and shows a "Resonance imaging apparatus" [See figure 1; col. 3 line 43 through col. 4 line 67; col. 2 lines 12-31; col. 1 lines 6-67; and the abstract.] "comprising a space for receiving a subject to be imaged," [See figures 1 through 5, and the intrinsic imaging space within the coils of figures 1 through 5.] "magnet means for applying a magnetic field to the space in a first direction, and a radio frequency (RF) coil array" [See figure 1, col. 1 lines 5-53; col. 2 line 13 through col. 3 line 18; col. 4 lines 34-51; col. 5 lines 18-52; col. 6 lines 55-67; col. 8 line 46 through col. 9 line 16.] "comprising a plurality of angularly spaced coil elements, each coil element having a pair of main conductors extending generally parallel to the direction of the magnetic field and located on opposite sides of the space, and a pair of connection conductor connected between respective ends of the main conductors." [See figures 1 through 5, the **rejection of claim 1** above, as well as the electrical connection conductors 82, 80 of figure 3.] The same reasons for rejection, which apply to **claims 1, 2**, also apply to **claim 7** and need not be reiterated.

15. With respect to **Claim 8, Boskamp et al.**, shows from figures 1 through 5 that "the space is a cylindrical space and the main conductors extend axially and are located diametrically opposite each other." [See figures 1 through 5.] The same reasons for rejection, which apply to **claims 1, 2, 7**, also apply to **claim 8** and need not be reiterated.

16. With respect to **Amended Claim 9, Boskamp et al.**, shows from figures 2 through 5 that "the coil elements are angularly spaced about the axis of the cylindrical space, ~~and are each located in a respective diametric plane of the cylindrical space.~~" [See figures 2 through 5.] The same reasons for rejection, which apply to **claims 1, 2, 3, 7, 8** also apply to **claim 9** and need not be reiterated.

17. With respect to **Claim 10, Boskamp et al.**, shows from figures 2 through 5 that "the coil elements" (i.e. 78a,78b; or 78c,78d) "are equi-angularly spaced, the angle between adjacent coils being $360/N$, where N is the number of coil elements in the array". [See figures 2 through 5, especially figure 3.] The same reasons for rejection,

which apply to **claims 1, 2, 3, 4, 7, 8, 9** also apply to **claim 10** and need not be reiterated.

18. With respect to **Amended Claim 11, Boskamp et al.**, shows from figures 2 through 5 that “the connection conductor” [See components 82, 80] extends around the periphery of the cylindrical space at a respective axial end thereof to thereby permit access to the cylindrical space through that end.” [See figures 2 through 5.] The same reasons for rejection, which apply to **claims 1, 2, 7, 8**, also apply to **claim 11** and need not be reiterated.

19. With respect to **Claim 12, Boskamp et al.**, teaches and shows from figures 2 through 7 that “the coil elements are arranged in one or more orthogonal pairs.” [See figures 2, 3, 4 and 5; col. 2 lines 31-37; col. 3 lines 7-18; col. 5 lines 18-27; col. 5 lines 34-52; col. 8 lines 30-33; and col. 9 lines 5-16.] The same reasons for rejection, which apply to **claims 1, 2, 7, 8** also apply to **claim 12** and need not be reiterated.

20. With respect to **Claim 13, Boskamp et al.**, shows from figures 1 through 7 and teaches that “each coil is used as a receiver coil, the apparatus further comprising a plurality of receiver channels each connected to a respective coil,” [See col. 1 lines 34-42; col. 3 lines 7-18; col. 4 lines 35-51; col. 5 lines 64-66; and col. 7 line 1 through col. 9 line 16] “and means for combining the signals” [See figures 4, 5, and 6, where the computer component 94, and the method of figure 5, where in function the signals “from each coil” are combined “to form a composite image”. [See col. 7 line 1 through col. 9 line 16.] The same reasons for rejection, which apply to **claims 1, 7**, also apply to **claim 13** and need not be reiterated.

21. With respect to **Claim 14, Boskamp et al.**, teaches that “at least one coil is **adapted** to be used as both a transmitter and receiver coil.” [See col. 1 lines 34-42; col. 2 lines 18-44; col. 3 lines 9-13; col. 4 line 36-51.] The same reasons for rejection, which apply to **claims 1, 7**, also apply to **claim 14** and need not be reiterated.

22. With respect to **Claim 15, Boskamp et al.**, teaches and shows that “the coil elements are arranged in one or more orthogonal pairs,” [See figures 2, 3, 4, and 5 especially figure 3] “one coil element in each pair being **adapted** for use as a transmitter coil and the other coil element in each pair being adapted for use as a receiver coil”,

[See col. 4 lines 49-67; col. 5 lines 18-48; col. 6 line 8 through col. 9 line 16.] The ability of “each orthogonal pair being sequentially active”, or simultaneously active as selected is taught from col. 2 lines 9-44; col. 3 lines 3-6; and col. 5 line 18 through col. 9 line 16 where the many different activation combinations are taught. The examiner notes that in col. 8 lines 11-13 any coil not being used in transmission are deactivated.] “the apparatus further comprising a receiver channel and switching means” [See the RF transceiver system with switch means 62] “for selectively connecting the receiver channel sequentially to the receiver coil of the active orthogonal pair”. [See figures 2 through 5; col. 4 lines 49-67; col. 5 lines 18-48; col. 6 line 8 through col. 9 line 16] The same reasons for rejection, which apply to **claims 1, 7**, also apply to **claim 15** and need not be reiterated.

23. With respect to **Claim 16, Boskamp et al.**, teaches that independent phase shifts are provided for the individually amplified components [See col. 6 lines 50-63 with figure 5] which shows that “each transmitter” / receiver “coil of each orthogonal pair” [See figures 2 through 5; col. 2 lines 33-37 col. 8 lines 26-41] “is adapted to generate a radio frequency pulse of different amplitude and phase to the transmitter coil(s) of the other orthogonal pair(s).” [See col. 6 lines 55-60]. The same reasons for rejection, which apply to **claims 1, 7, 15** also apply to **claim 16** and need not be reiterated.

24. With respect to **Claim 17, Boskamp et al.**, shows from figure 1, switching means component 62 and computer 94 which controls the timing of the switch means 62 for each of the coils, in the RF array of **Boskamp et al.**, “A rotary switched RF coil array arrangement for combined imaging of a subject located in a cylindrical space, the coil array arrangement comprising a plurality of separate coils spaced angularly about the axis of the cylindrical space, each coil including a pair of main conductors extending axially on diametrically opposite sides of the cylindrical space, a receiver channel, and switching means for selectively connecting the receiver channel sequentially to the coils.” [See col. 1 line 6 through col. 9 line 16; the abstract, and figures 1 through 6.] The same reasons for rejection, which apply to **claims 1, 7, 15** also apply to **claim 17** and need not be reiterated.

25. With respect to **Amended Claim 18, Boskamp et al.**, shows from figures 2 through 4 that "each coil has a pair of connection conductors (i.e. 80, 82) "connected between respective ends of the main conductors" (i.e. 78a-d), [See figure 3] "the connection conductors ~~at one or both ends~~ being non-diametrical to permit access through the respective axial end of the cylindrical space." [See figures 2 through 5, especially figure 3.] The same reasons for rejection, which apply to **claims 1, 7, 15, 17** also apply to **claim 18** and need not be reiterated.

26. **Claims 1-18** are also rejected under **35 U.S.C. 102(e)** as being anticipated by **Boskamp et al.**, US patent application publication **2002/0149367 A1** published **October 17th 2002**, filed April 17th 2001. This reference corresponds to the applied **Boskamp et al.**, US patent 6,590,392 B2 applied above. Therefore a further detailed listing of the same corresponding teachings and figures is considered to be redundant and unnecessary.

Response to Arguments

27. Applicant's arguments with respect to **claims 1-18** from the amendment and response of **January 3rd 2007** have been considered but are moot in view of the new ground(s) of rejection. This action is **non-final**.

Prior Art of Record

28. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A) **Visser et al.**, US patent 6,870,368 B2 issued March 22nd 2005, filed February 5th 2002.

B) **Visser et al.**, US patent application publication **2002/0125888 A1** published **September 12th 2002**, filed February 5th 2002. This reference corresponds to the applied **Visser et al.**, US patent 6,870,368 B2

Conclusion

29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is: (571) 272-

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2241. The examiner can normally be reached on Monday-Thursday from 7:00am to 4:30pm., and on alternate Friday's from 7:00am to 3:30pm.

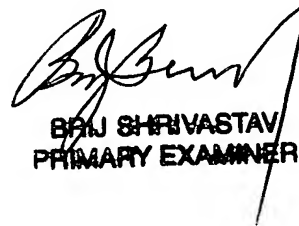
30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez, can be reached at (571) 272-2245. The **only official fax phone number** for the organization where this application or proceeding is assigned is **(571) 273-8300**.

31. Information regarding the status of an application may be obtained from the Patent Application information Retrieval (PAIR) system Status information for published applications may be obtained from either Private PMR or Public PMR. Status information for unpublished applications is available through Private PMR only. For more information about the PMR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PMR system contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



TAF

March 14, 2007



BRIJ SHRIVASTAVA
PRIMARY EXAMINER